AMERICAN JOURNAL
OF
PHOTOGRAPHY

THOS. H. McCOLLIN, Managing Editor.
JULIUS F. SACHSE, Editor. XANTHUS SMITH, Associate Editor.

VOL. XIV. JUNE, 1893. No. 162.

THE WORLD'S FAIR.

THE great exhibition at Chicago is at last an accomplished fact, the electric button, setting all the machinery in motion, has been touched by the President of the United States, amidst the huzzas of tens of thousands of visitors, the booming of cannon, and the jubilee incident to so great an occasion. The great buildings at Jackson Park by the lakeside are now open to the general public. Unfortunately the exhibition, so far as the exhibits are concerned, is not yet in order. Strenuous efforts, however, are being made to bring order out of chaos by June.

Private advices regarding the photographic department state that on the opening week everything was still in general confusion. As usual Pennsylvania was in the advance, the exhibit of a Philadelphia firm being the only one of the larger displays which was in place and ready. We regret to learn that from all appearances the photographic exhibit will not be what it should be, and the *Eye*, a photographic periodical of Chicago, goes so far as to state that it will not be surprising if a larger exhibit is made at the photographers' exhibition at the Convention of the P. A. of A. in July than the one at the World's Exhibition. If such should be the case it will be the greatest mistake ever made by the photographic guild, and it should be borne in mind that it is not yet too late to amend matters.

It is expected that the exhibits of the three Ohio photographers, Baker of Columbus, Appleton of Dayton, and Landy of Cincinnati, will be especially fine. Stine & Rosch, Kline, Morrison, Place, Harrison and others of Chicago are all striving to make a fine show and obtain first prizes. McMichael of Buffalo is also an exhibitor, but not yet open to the public. The various dry-plate makers will also have large exhibits, mainly of work made upon their plates. The Eastman Kodak Co. of Rochester and the Photo-Materials Co. of the same city are making strenuous efforts to attract the photographic public. The former company will without doubt have the largest individual exhibit in the photographic department.

The exhibits of hand cameras will be surprising both in variety and construction. Fuller and itemized accounts of the photographic department will be noticed in these pages in future numbers.

An Interesting Use of Photography.—A French photographer lately invented a process by which a bit of ordinary paper—the leaf of a book, for example—can be made sensitive to the light without affecting the rest of the page. Acting on this hint the French War Minister has begun to take the portraits of conscripts and recruits on the paper which gives their height, complexion, age, etc.; and the cheapness and swiftness of the operation, which is already in use in the French army, is something remarkable. It costs only one cent to get two copies of a portrait of Jacques Bonhomme—one for his individual register and the other for his muster roll: and so rapid is the process that in a few hours a whole regiment can be so photographed. The soldiers file along, one by one, and each sits for three seconds in the photographic chair, and the thing is done.

They even mark the man's regimental number on his breast with chalk, and thus get a complete identification of him in case of desertion or death, or when a discharged soldier presents his claim for pay or a pension. If such a system had been in use during our civil war the Pension Bureau would not now be paying out so many thousand dollars a quarter to deserters, bounty jumpers, and other sham heroes of the Union Army.

THE INFLUENCE OF THE HAND CAMERA.[1]

WALTER D. WELFORD.

THE spirit of exaggeration is one of the necessary evils attending the development of photographic civilization. For years hand-camera workers have been pushing to the front, and striving to make the general photographic public decent and respectably-minded citizens. But the dawn of reason has only just arrived, and, though tardily admitted, the *raison-d'etre* of the hand camera is now recognized. It is possible for the veriest fanatic to now address an ordinary society upon what, in his opinion, are the points of hand-camera work,—that is, he can now do it without the sneers and quiet scoffs of the old-timers. So that, in venturing to address myself to the decent and respectably-minded body of men that compose the London and Provincial Association, I feel that, whatever the criticism may be, it will be just and generous. Above all things, I am sure you will fight, when the time comes, with interest in, and appreciation of, the hand camera itself. The battle hitherto has been between a small body of earnest men determined to advance, whilst opposed to them were thousands of skirmishers, who were too busy with other things to pay much attention to the invading force. The battle-cry of one was, "We are here, and we've come to stay," answered impatiently by the skirmishers, "Tut, tut! run away, little boys, and play," or "Bother these folks, what can they do? what rubbish to trouble us!" The first sign of the dawn of reason I detected some time ago, when I heard that a member of the London and Provincial Association had actually agreed to look at a hand camera, and it was thought to be a reasonable supposition that, ere long, he might actually handle the monstrosity. And now—well,

> "Do I dream, do I doubt,
> Or is visions about?"

Of course I mean *visions* of hand cameras. I hope you will correct me if I am wrong, but I believe you actually have men now who *use* a hand camera. What has happened to the poor

[1] Read before the London and Provincial Photographic Association.

London and Provincial Association? Has it been having too much "spirits" of late?

I said at the commencement that exaggeration is necessary nowadays. If a man wants to sell his camera, he asks 5l. 10s. for it, so that he can get 4l. 10s. by "reduction in the camera." You may perchance imagine I am on the same tack, that I am claiming (or, rather, shall claim directly) a good deal too much for the influence of the hand camera, so that I can climb down a little to appease your wrath, and yet get pretty well all I wanted to. Personally, by the conviction of experience, I believe all I say. You may not; that is your fault. In a few years' time they will be accepted as facts.

The influences of the hand camera run in several directions. For convenience' sake I have classified them into two

Photographic,
Mental or physical.

By an "influence of the hand camera" I mean some power or incentive towards improvement, in which the hand camera has been the sole—or, at least, principal—factor. To make a definite start thereto, I claim that it has been of considerable use in improving photographic materials, apparatus, etc.

Speed of Plates.—Much interest has of late centered round the great efforts of some of our platemakers to obtain the maximum rapidity of emulsion. The makers would hardly do this unless to supply a want; that must be admitted. The point is, from what does the demand spring? I allege from the hand camera. But it may be said, instantaneous photography in the ordinary camera must not be overlooked. Certainly not, nor the fact that the reduction of exposure in a studio of portraiture, especially baby and child studies, for dimly lighted interiors, and for portraiture by artificial light, is a convenience the desirability of attainment of which, no doubt, has helped in the same direction. There are possibly other causes which I have not enumerated. I admit their power, but deny their importance as compared with the requirements of the hand-camera worker. You may mass all these factors in a lump, and still the hand camera towers above that lump as a mountain to a pinhole. The increased speed of

plates is due to the hand camera, and, whatever weight other considerations may have added, they have only been as a single black pin is to a full box of white. It is there certainly, but it does not make us buy the box. If there be any gain to photographers by the increase of plate speed, to the hand camera the credit must be placed.

Apparatus.—In several directions the influence may be seen In order to diminish the enormous disparity in bulk and weight between the ordinary and the hand cameras, the former have been cut down in every possible direction. A hand-camera worker grumbles at the unnecessary weight of his 10x8 ordinary. Results, improvements and new patents galore. The necessity of reducing the shutter to small dimensions, in order to go inside the limited space of a modern hand camera, has brought upon the market a number of small and ingenious shutters. Possibly some of these and other improvements in apparatus, such as lighter tripod, dark slides, and the use of aluminum, would have arrived in due course. But we've got them *now*, and the hand camera did it.

Small Work.—Although it cannot yet be said that the day of small work has arrived, yet I claim that we are now appreciating quarter-plate prints very much more than we did. This has been a gradual growth truly, but a *resume* of exhibitions during, say, the last two years would certainly prove the existence of the growth. In the old days the reports were something like this: "Mr. Blank shows a frame of snap-shots, which, as such, are very good." "As such," indeed; that is where the blind bigotry crept to the front. It was usual in those days to term them "snap-shots." Never mind if evidences of composition, careful treatment, and individuality were visible in the prints—that did not matter. They were snap-shots—no more, no—well, I cannot say no less, as no further degradation of photography could be, they imagined. They were taken in a hand camera, and that damned them for all time. But now—they are snap-shots no longer, but prints the same as the rest. The influence has carried us toward the recognition of merit in the smaller sizes of prints, so much so that ordinary quarter-plate and 5x4 are constantly represented.

I'll admit that we have not yet reached rock bottom on this question, for, undoubtedly, small work does not receive its full meed of recognition; nor can it be said that hand-camera work is yet free from enemies. Even now, some puffed-up, unmitigated egotist of the high-art school waxes wroth occasionally, and provides padding for one of the photographic publications. He is usually one of those to whom photography must mean "art" or nothing. Well, we hand-camera workers do not suffer very much; I presume we have the proverbial duck's back. Anyway, Mrs. Artist Partington has no broom capable of keeping back the tide of the hand camera. Personally, I consider any man who believes that photography is entirely concerned with art, science, or, indeed, any *one* branch, to the exclusion of every other, may safely be written down an ass. Hobbies may be ridden to the death, but they must not be allowed to order all others off the road.

Increase of Photographers.—Another very powerful influence is that of increasing the number of photographers. I don't think it can be denied that the principle of "You press the button, we do the rest," has increased the number of workers considerably. Many hundreds of the outside public, whom the very mention of a camera, tripod, lens, etc., would have frightened into fits, have bought a hand camera, to do "button-pressing" for themselves. Many of these must have been seduced into our ranks; for the step from having "the rest" done by some one else to the doing of it themselves, was one of the easiest transition. Upon this point let me not be misunderstood. I cannot claim that all "button-pressers" have become photographers (this is a terse way of putting it), but certainly a good many have been so pleased with their new hobby that they *have* made the plunge.

Better Posing of Figures.—This is another influence I claim. Of course, I know full well that all good photographers pay, and have paid, every attention to this matter; but my point is that the hand camera has stimulated effort in the same direction amongst the lesser workers. Let us suppose a case of Smith, a half or whole-plate man, and his friend Brown, a snap-shot man. Smith is a careful worker of several years' experience, whilst

Brown is but a beginner. Upon a comparison of results, Smith finds that in all his pictures there is too much staring at the camera if he introduces figures in the scene. He finds in Brown's shots, poor though they may be either artistically or technically, that, at all events, every one is not rooted to the spot, looking at the camera, and having the appearance of plaster-of-Paris images plumped down into the landseape, wishing they hadn't come, and wondering how they are going to get out. He takes the lesson to heart, and improvement in this respect follows. I am not saying this without authority, for I have seen the change in the work of many of my friends.

Illustrated Journalism has benefited by the hand camera, as witness the reproductions of shots in the *Pall Mall Gazette*, the *Westminster Gazette*, and other up-to-date periodicals. The hand camera gives the power of depicting life and incident, which to the ordinary camera are impossibilities. This leads me to my last point in this section, but it is in no way least. Indeed I would lay considerable stress upon it. It is the influence of

Life and Character Studies.—As photographers we ought, I really believe, to feel a considerable amount of shame at the neglect of such a fine opportunity. If so be a hundred years hence it may be asked what has photography done, is the reply to be that it has produced pictures (at least the art photographer calls them so, though the painter will in no wise admit the fact), and pictures only? Certainly not. We can point to its use in astronomy, microscopic, medical, and many other directions, including the preservation of historic buildings and spots of interest. But will it not be asked at once, "Why did you not with the ample means at your command preserve for us the dress and fashion, the characters and incidents, the every-day life and bustle of the street?" Are we to answer that we sat at the feet of art masters who taught us so much about the diffusion of focus, the rules and canons of art, the composition, light and shade, freedom of treatment, idealism, realism, impressionism, and a few more "isms," that we either had no time, or were afraid to descend to such commonplace work as the life and character of the present century? I trust not, and sincerely hope

a better account of our duty can be given. Here with the hand camera we have the opportunity of portraying for posterity life, —life with its joys and sorrows, its sunshine and shadow, its comedy and pathos. The hand camera can in many cases do this better than the artist, and at all events we can do very much more in a given time. I have on many occasions fallen foul of photographic survey work, especially when any limitations of size or anything else debar hand-camera prints. Because that means the exclusion of life and character, which I firmly believe will have much more interest for future generations than these old mills, river banks, abbeys and castles, churches and public-houses (interior and exterior of each, of course), wandering brooks, etc. These may be stamped with the individuality of the artist; they may have clouds skillfully printed in from another negative; they may show the stream from the artist's house looking south, from the west, from the east, with the artist's house in the distance, and from round the corner; they may be sharp all over or sharp nowhere, but there is no life about them. Certainly, a farm laborer, say, may be introduced into the stream picture, but he will have his best go-to-meeting clothes on, be gracefully posed, and wear an expression upon his face a conjunction of care whether the cow is likely to get into the field, if this operation will keep him later at work, and whether he'll get a copy of the print. We may also be able to show studies of natives taken in the studio, with impossible backgrounds and sitting upon papier-mache rocks, or standing in the street spruced up for the occasion, carefully posed, erect and manly, wondering what would happen if the show "bust."

After all, is there no art in the portrayal of life and movement? Is there no art in depicting the emotions and feelings by the expression upon the countenance? Are we to shut our eyes to the pathetic or humorous side of living nature? Must all art consist of dead tree-trunks, printed in clouds that run over the trees and landscapes as if they were not quite sure just where they ought to be, and streaks of sunlight caught on the spree?

Must we produce representations of nature in an intoxicated state, or, as Captain Abney expressed it, "makes one perfectly sick to look at?"

No, good army of hand-camera workers, let not your hearts be troubled by this high art falutin. Keep steadily on the way of life and character, which is one of the hand camera's strongest directions of work, and the future will bless you equally with those who portray nature rubber-stamped with their own originality or eccentricity.

I have wandered slightly from my subject, but the influence of the hand camera is, and must be still more, felt in the direction of immortalizing the men and women of to-day.

Mental and Physical Influences.—I now come to a somewhat more difficult subject to tackle, viz., the influences, physical and mental, of the hand camera. I don't expect you will agree with me upon some of the points at all, for the reason that, until a man has become a really earnest worker of some experience, these influences can hardly be understood. The hand camera, to my mind, exercises a considerable power of education, both mentally and physically. At all events, I have so found it. As the two points are so interwoven one with the other, it will be necessary to treat them together. The directions I refer to are principally increased speed of artistic perception, improving the vision, and quickness of action and decision. It is, perhaps, true that the class of work principally undertaken by each worker will make this point of lesser or greater importance. One who goes in for street work or rapidly moving objects will benefit more in these respects than the landscape worker. I still hold the opinion that successful hand-camera workers are born rather than made. Nevertheless, I cannot lose sight of the educational power of actual practice, for, speaking personally, the hand camera has quickened my thoughts and actions to a not unimportant degree. Speed in work and thought in these go-ahead times is not to be sneered at, and I do positively assert that I can work at greater speed, think, and decide more quickly than before using a hand camera. Take the question of focusing rapidly, and, to illustrate it best, let it be tried on a full-size focusing screen upon an approaching object. A few trials will prove how much more quickly it is possible to decide when actually sharp, and to fire the shutter, than it was at first. The whole question of thought and

action following therefrom is quickened. To illustrate this, let me mention another capital test, that by electricity at the Aquarium, a test of vision and action. A pistol is held in the hand and a disc is watched. At a curtain time a definite object passes this disc, and the task is to quickly fire the pistol, an electric arrangement of a black band registering the time that elapses between seeing the object and firing the pistol. Take an ordinary photographer (he must not be a shooting man, however), pit him against an experienced hand-camera worker, and the difference in the fractions of the second will be startling. Nay, further, let the hand-camera worker first try after a month or two's absence from the camera, and then, second, after he has been with it in the streets that day. He will be struck with the improvement. I therefore claim that the hand camera so improves our vision, our thoughts, our actions, in the direction of speed as to materially alter even a man's character. He decides and performs the result of the decision more quickly. He becomes sharp, prompt, and decisive, and past hesitations vanish. The hand camera therefore has considerable influence in altering the mould of the man.

I am ready to admit that the second division of influences may not appear of very much account, but am, nevertheless, convinced that, even if that is so, it is because I have not the ability to put these considerations before you properly.

In conclusion, I claim for the hand camera the following points: 1, Increasing speed of plates; 2, Improving apparatus generally; 3, Causing greater attention to small work; 4, Increasing the number of photographers; 5, Naturalness of posing; 6, Aiding illustrated journalism and the study of life and character; 7, Improving mental and physical action.

This paper is no weak-minded, cover-all-the-ground sort of attempt, but may almost be termed a fighting one. It is not hedged in with "buts" and "perhaps," and admissions or concessions, so as to prevent discussion or criticism. I have said what I believe and what I am prepared to defend from any honest enemy. And in that spirit I offer it to-night in the words of Hamlet:

"Our thoughts are ours; their ends none of our own."

A NEGLECTED ART.

XANTHUS SMITH.

TO any one at all given to philosophizing there is nothing which forms a more constant source of interest than the whims and vagaries of fashion.

It is, no doubt, altogether owing to the strong instinct or craving in human nature for novelty that we find this constant disposition to drop what often appears of the greatest excellence intrinsically, and to rush after something which is either entirely new, or merely new from its having lain dormant for a number of years.

If the power of judgment were, or could be, always fairly exercised this rage for novelty would undoubtedly be rather beneficial than otherwise. It is in keeping with that progressive system which seems to form a portion of nature's laws, and if we could set aside invariably the less perfect and less useful in all we do, the world of human nature would indeed be progressing rapidly for the best in this search for novelty. But, unfortunately, this is not the case, and we are constantly led to regret that many things are being relegated to a musty state of indifference which, if they are not really in every way better than those which are occupying their place, are of such equal merit that they fully deserve to hold their own in daily usefulness.

All matters pertaining to art suffer more from the whims of fashion than do useful and practical affairs, and, therefore, it is not strange that we meet with changes and ideas and tastes in the business of photography which we may doubt are always for the best. Many of these on account of their extreme oddity are for the time very taking, but generally the more *outré* they are the more ephemeral we find them. There are a few of the broader divisions, though, in the uses and entertainments of photography, which are of a lasting kind, and we feel therefore should more nearly keep pace with one another in public estimation than they do.

We feel that in the almost total neglect of stereoscopic photography the craft, both professional and amateur, and the public, are depriving themselves of one of the nicest fields of entertainment to which the art is open.

Let any of those of us who are old enough, recall the condition of this art some thirty years ago, and we are sure he will wonder why the stereoscopic picture should have so completely dropped out of sight. Let him recall the work issued by companies and individuals both here and in Europe, the thousands of views and studio compositions that were published, and the eagerness with which they were purchased by all who had any interest in art, or who could at all afford to indulge in such refined luxuries, and will the idea not force itself upon him that there is really something strange in this change of taste? If he places himself retrospectively in the position of very many at that time who hung impecuniously over the fine views published by the London Stereoscopic Company with their accompanying stereoscopes, and the thousands of beautiful transparencies of Swiss scenery and architectural views in European cities, and for the less refined the cheap tourist views and commonplace groups, with the simplest form of hand stereoscope, with which the well-to-do-farmer and artisan entertained himself and his friends, thinking, as he does so, what a fair little rage there was to possess this stereoscopic luxury, and of the best that could be afforded, and will not the following questions force themselves upon him, What has become of the stereoscope and its accompanying views? Why this absolute lack of interest in so beautiful an art? Is it due entirely to change of fashion? Having been so fashionable, must it necessarily be dropped almost to oblivion? Is the absence of production entirely due to lack of demand? and, finally, Has this branch of photographic entertainment been replaced by any other which more fully or equally fills its place?

The first of the above questions we cannot answer. We have our own stereoscope and views, and derive as much pleasure from them as ever we did, but when it comes to answering for our friends who were alike provided we can only wonder, and that is all. As to the next, the lack of interest, we cannot help

admitting the fear that the vulgar whim of fashion has a good deal to do in this instance as in so many others, in abhorring that which is good, simply owing to the cry of common, an old thing, out of fashion.

The lack of production owing to the want of demand applies readily and reasonably enough as the cause of the professional photographers dropping this branch of his art, but it most surely does not to the amateur, who now turns out such an abundance of work. And, as to the last question, we feel that we may say without dispute, that the entertainment of the stereoscope has not been replaced by anything which fully fills its place.

The lantern with its accompanying slides has certainly filled the place in one way, and to a certain extent, of the stereoscopic view, inasmuch as it is absorbing the interest and time of a large number of both professional and amateur photographers. And it is certainly admirable in its way, affording as it does a very gratifying exhibition, under good conditions, to a large number of persons. But while it far exceeds as a means of entertainment and in usefulness most all other branches of art representation, it can never be domesticated, so to speak, in the way that the stereoscope can.

No one can dispute the pleasure to be derived from a fine magic lantern exhibition, wherein the benefit is had of the oxy-hydrogen light, the absolutely flat white surface for projecting upon, and well-made slides. But all these conditions are only to be had in a public exhibition, or, perhaps, by some wealthy amateur. When we wish to utilize our photographic work by a family exhibition, or to exhibit it to a few friends or a country Sunday-School even, we encounter a number of difficulties which at best mar the pleasure if they do not entirely destroy it. If we overcome the wrinkled swinging white sheet, we still have the smothering room and the smoking or overheating lamp, giving dim enough light at best; and, almost invariably, just sufficient want of crispness in the picture to make us think that our eyes or something else must be wrong. And, moreover, as no two persons want to dwell the same length of time upon a view, it must either be snatched away from you before you are half

through with it, or else you must feel that you are tiring your neighbor with what is of no interest to him while the picture is displayed for your benefit. Lastly, to us there is always an extreme unsatisfactoriness in a large picture in monochrome simply. When we enlarge a picture by many feet we begin to cope with nature, and the absence of color only becomes the more aggravating as we increase the size of the view. For this reason, in the perfect magic lantern exhibition, we must necessarily have many finely-colored views, which, owing to their expensiveness, are entirely beyond the means of all but a comparatively few.

The very lack of pretentiousness of the stereoscope, together with the extreme pleasure that is derived from the deception in looking at photographic views by its aid, make it a most attractive entertainment, and one which is not at all necessarily superseded by the magic lantern display. And when we know at what comparatively little cost a good stereoscope may be had, and that it may lie about with the accompanying views to be picked up at any moment by ourselves or our friends for a few minutes' entertainment, just as we would a book by a favorite author, we cannot help feeling a strong desire to see it again hold the place in public estimation which it did in times gone by.

There is no doubt but that the cheapening of stereoscopic work, and consequent unsatisfactoriness of the use of the stereoscope, in looking at the views published with it, may have had a great deal to do with the falling off of general interest in stereoscopic art.

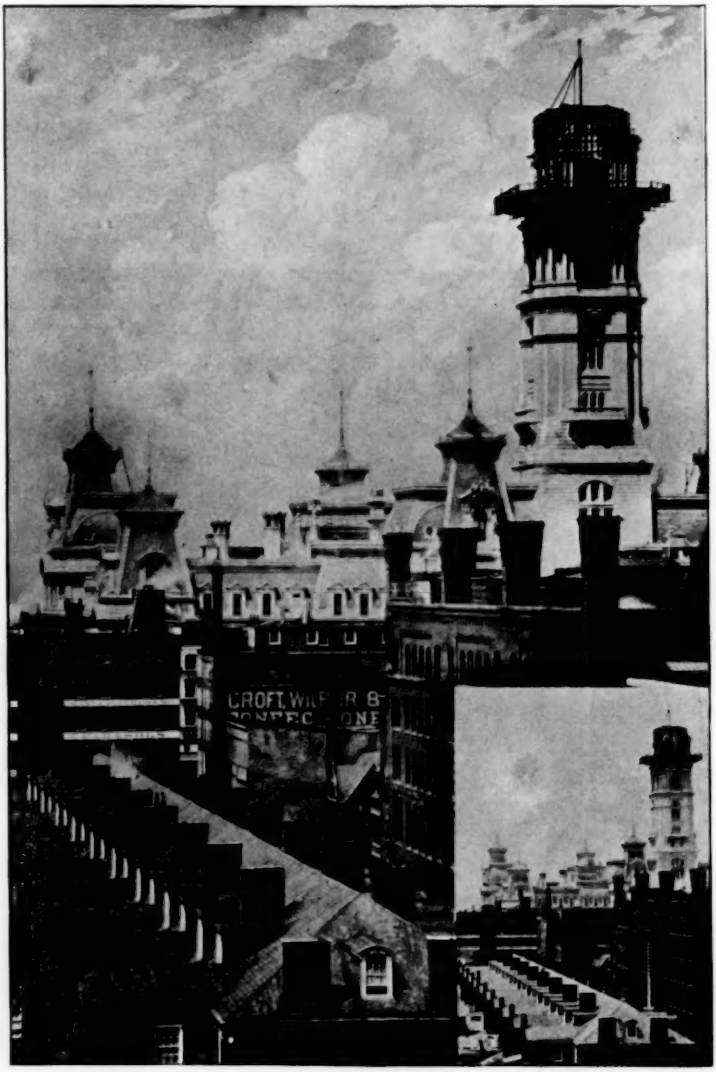
A very considerable amount of care is required in the manipulation of stereoscopic work, and whenever there is carelessness in the management of even the smallest detail the effect is ruinous of the pleasure which is intended to be conveyed. The fruitful causes of failure to produce proper and highly satisfactory work in much of that done in Europe, towards the east, and still more of the American work were, carelessness about the distance of the objectives from each other in taking the views, the same in mounting. Not mounting the views absolutely perpendicularly and horizontally. Not trimming the views so as to have the same marginal termination. Spots and imperfections in the views, and

lastly, and of most importance, making the views too large. This later defect or blunder pertained in a large amount of the work done in this country, especially in the stereoscopic views made on the routes of travel and sold to excursionists and summer tourists. When the picture is enlarged above a certain size the effect upon the eyes, in their effort to make the two views fall into one, is so distressing that one soon throws down the stereoscope in disgust. They are admirable photographs, and conform to all the requirements of the stereoscopic view, except that they are too large. They are only to be looked at with satisfaction by covering one and viewing the other as you would an ordinary photograph. It is possible, no doubt, that there may be persons with peculiarly placed eyes,—further apart and capable of taking in a larger field perhaps,—who will derive full satisfaction from such views with the stereoscope, but it is important that the maker of stereoscopic views for the general public, should hit about as near the normal average of vision as he possibly can. The lenses magnify a small stereoscopic view sufficiently to make the picture quite satisfactory as to size when we are viewing it, and it is folly to strain the point to go beyond this.

There are hundreds of subjects which would make very satisfactory and entertaining stereoscopic pictures, that would be almost worthless if photographed in the ordinary way, and for this reason: In an ordinary photograph, unless we have a pretty well blocked out subject, or one well massed in light and shadow, we get no relief. As we all know, a poorly-lighted subject comprising a great many objects jumbled together makes such a flat, mixed-up picture that we cannot separate one object from another. This defect is entirely overcome by the stereoscope, and some of the most attractive stereoscopic pictures are those of which you can scarcely make head or tail out of the stereoscope. On this account closed-in wood scenes with their perfect jumble of stems and leafage, and rocky dells with waterfalls give us admirable subjects for stereoscopic views, and architectural and apartment scenes are amongst those peculiarly well adapted to the stereoscope.

It may be a question as to whether open and extended landscape views are the better as stereoscopic views. Certain it is that when they are attempted they must be done in the most perfect manner possible. We have seen some glass transparencies of Alpine scenery which left nothing to be desired, and in the use of portrait and group work we feel that in the majority of cases the deceptive relief is of no advantage; you cannot make people. It is but a picture after all, and the ordinary flat picture is probably more satisfactory than the realistic, life-like, yet lifeless representations made by the stereoscope. This, though, will be merely a matter of opinion, as, indeed, must be the whole subject of the comparative merits of stereoscopic photography, and therefore the foregoing remarks should be taken rather as hints and suggestions than otherwise. But we know that there are many like ourselves, who would gladly see a revival of stereoscopic photography to its old domain, and if we could even in the slightest way help to bring about a re-instatement of this highly interesting and now greatly neglected art, we would most gladly do so.

The Sound of a Sunbeam.—One of the most wonderful of the many discoveries in science that have been made during the past few years is the fact that a ray of light produces sound. A beam of sunlight is caused to pass through a prism, so as to produce what is called the solar spectrum or rainbow. A disk, having slits cut in it is revolved swiftly and the colored light of the rainbow is made to break through it. Place the ear to a vessel containing silk, wool, or other colored material. As the colored lights of the spectrun fall upon it, sounds will be given by different parts of the spectrum, and there will be silence in other parts. For instance, if the vessel contains red worsted and the green light flashes upon it, loud sounds will be given. Only feeble sounds will be heard if the red and blue parts of the rainbow fall upon the vessel, and other colors make no sound at all. Green silk gives sound best in a red light. Every kind of material gives more or less sound in different colors, and utters no sound in others.



COMPARATIVE TEST OF THE PARVIN TELE-PHOTO LENS AND RAPID RECTILINEAR LENS OF EQUAL DIAMETER, BOTH TAKEN FROM SAME STANDPOINT.

THE PARVIN TELE-PHOTO LENS.[1]

JULIUS F. SACHSE.

TOWARDS the close of the year 1891, the scientific world was startled by an announcement made by Dr. Miethe of Berlin before a meeting of the society of "Practical Photographers" in Berlin, that a new photographic objective had been constructed upon an entire new principle, which would overcome distance to an extraordinary degree, and with a normal extension of camera length would produce results heretofore thought to be impossible.

At this meeting, held November 4th, 1891, a specimen print was shown, the image of a monument on the Rhine, taken from the opposite shore at a distance of over two thousand meters and measuring ten centimeters.

Almost instantaneously with this announcement came one from the noted English optician, Thomas R. Dallmeyer, giving notice of a similar invention, by which he had obtained, with an ordinary camera, the image of a crow in mid-air over one hundred yards distant, measuring about three-quarters of an inch from tip to tip.

The description of the new objective of Dr. Adolph Miethe, together with specimen prints, were first brought before the American public by the writer in the February and March numbers of the AMERICAN JOURNAL OF PHOTOGRAPHY, for 1893.

Subsequently the matter was brought to the notice of this Institute by one of your members.

These specimen results, which showed one of the greatest advances made for years in photographic optics, naturally created considerable attention in scientific quarters, and numerous experiments were made to construct similar lenses in this country.

One of the most enthusiastic experimenters in this field of photographic optics was your fellow-member, the late W. A. Cheyney, a man thoroughly versed in the science of optics.

[1] Read before the Franklin Institute, May 17th, 1893.

Mr. Cheyney's experiments were conducted upon similar lines to the foreign ones as laid down by Dr. Adolph Miethe, viz.: A combination of the regular objective with a negative element fixed in an adjustable telescopic draw tube, independent of the adjustment of the camera bellows.

Specimens of results obtained by him showed satisfactory progress; his labors, however, as you know, were interrupted by his untimely death.

Another experimenter who became interested in the new departure in photographic optics was Mr. Albert B. Parvin, also of this city, and I now have the honor to introduce to you for your inspection and consideration, a result of his labors, viz.: A new tele-photo lens, which differs in construction and action from its European prototypes.

In the first place, the new objective is contained within an ordinary lens-tube two and five-eighths inches long, and it requires no delicate adjustment prior to taking the camera focus. Secondly, the remarkable rapidity or speed with which the new lens works is in direct contrast to the European systems, which are not rapid enough for instantaneous work. A specimen print which I have here to show you, according to the maker was taken on a rainy day, at half a mile range. Stop *f*-42, in one-fiftieth of a second. The picture certainly shows excellent illumination and sharp definition, even the cordage of the vessel being clearly cut.

Another peculiarity claimed for this new tele-photo lens is its covering power. The lens here for your inspection is one and three-thirty-seconds of an inch in diameter, equal to what is known as a Ross six by five lens, yet, as you will perceive by the specimens here shown, it more than covers a ten by twelve plate sharply, while the same test (C) made with a five by eight Beck lens, which is about an inch and a quarter in diameter, falls far short of covering the plate.

As to the "tele-focal" powers of the new lens (if I may use the term), a comparison of the two views marked A and B will give some idea of its scope. Both are taken from the same standpoint. The former (A) is taken with the new Parvin lens,

the latter (B) with a Beck lens of almost the same dimensions. These three experiments, A, B, C, were all made by the inventor from the same standpoint. Exposure A, two seconds; B, three seconds; C, two seconds; stop in all, *f*-64.

An examination of the Parvin picture will show the great depth of focus, and its claim to absolute rectilinearity. As to my personal experience with the new tele-photo objective, I will state that upon two occasions I had an opportunity to test the new objective. Both experiments were, however, confined exclusively to trials in focusing upon the ground-glass, the main object being to calculate the magnification, and determine its powers and possibilities in actual practice, and its adoption for scientific work, such as falls to the every-day lot of the naturalist or geologist, by affording means to record photographically objects which are beyond the reach of the focal length of the ordinary objective. These comparative tests, made with both eight-by-five Ross and five-by-seven Darlot objectives, showed that the magnification of the new lens was brought about five times greater than the regular objectives of equal diameter. Excellent results were shown upon formations distant 100 to 1,000 yards by actual stepping, the finest detail being sharp and clear-cut, with an open aperture, the camera extension being fifteen inches.

In focusing upon objects distant from three to four miles, such as the Fairmount Observatory from Belmont, the iron rods and structure showed plain and distinct against the sky. The same may be said of the tower of the new City Hall, distant four miles from the same standpoint, which with the old objectives, from the same standpoint, are hardly discernible. These results led me to believe that the new tele-photo lens would be of considerable value in the hands of the scientific student, and of photographic tourists.

The new lens, as it becomes better known, will no doubt prove indispensable to the amateur and tourist, as it will give opportunities for obtaining views and bits of detail otherwise unobtainable with the means which, under ordinary circumstances, are within the reach of the traveling amateur. The new lens offers to him magnification, in addition to rapid work and sharp definition.

For very close work, such as laboratory or studio work, I find that the new lens is not so well adapted as some of the older forms of objectives, the magnification being a fixed one. This, however, is not to be taken as detrimental to the new objective, as the sample furnished for experiment was calculated entirely for distant outside work. In the near future specimens will be forthcoming where the same principle is adapted for interior work.

In conclusion I will state that no such extreme telescopic properties are claimed for the new Parvin lens as have been shown by the German and English lenses having adjustable magnifiers.

I allude now to such views as that of Mont Blanc, at a distance of forty-four miles, taken from Belleview, near Geneva, at a distance by Fred. Boissonias, which was lately exhibited in this city. Further, it is stated that this view was made in a camera built expressly for the purpose, with a draw of 66 inches, the time of exposure being ten minutes.

The claim made for the Philadelphia tele-photo lens is that it is a simple and practical objective, having a fixed system of magnification, the whole being constructed for ordinary use in the hands of the average photographer of the day.

One of the greatest advantages claimed for the new Parvin lens over all the European telescopic lens systems is the fact that the new lens works instantaneously, even when stopped down to *f*-45.

The *Photographische Nachrichten* published in Berlin no later than April 27th last (p. 216) distinctly mentions that the German tele-photo objectives are not suited for instantaneous work. Here we have proof of the claims of the new American objective.

I submit for your inspection a number of comparative photographs, all made by the inventor of the new lens, which will enable you to judge intelligently of the magnification, covering power, rectilinearity and speed, some of them being produced by an exposure of one-fifteenth of a second.

I now leave the subject in your hands for further investigation.

In art a portrait must be executed before it is turned over to the anging committee.

THE TURKEYTOWN HYPO CLUB.

IT was a gala night at the Turkeytown Hypo Club. The special order for the evening was devoted to scientific communications, the especial feature being the subject of halation, and the latest means taken to overcome that evil. After the routine business had been finished, the president announced that new scientific communications were in order, and that the special subject for the evening had been selected on account of the importance of the subject and the late improvements made by various manufacturers of dry plates to overcome the difficulty, and that he should be pleased to hear any expression on the subject by the members.

Dr. Oxalate here arose, and stated that he had carefully read the advertisements and accounts of all the makers of plates in the AMERICAN JOURNAL OF PHOTOGRAPHY, but had not been able to make up his mind which to try, as all claimed to be the perfect plate, and whereas the English makers claimed to have achieved the object by a plate having a number of strata upon their plates each consisting of an emulsion of a different degree of sensitiveness, one American maker claimed to achieve the same result with two super-imposed films; another claimed same results without disclosing how his plates were constructed, and still another American manufacturer, in direct opposition to all other makers of non-halation plates, advertised an orthochromatic plate by ordinary construction having an opaque-coating applied in optical contact, and thereby results could be obtained superior to any with multi-coated plates with far less trouble, as the development and manipulation entailed no more trouble than any ordinary plate. Now the doctor would like to ask whether any of the members present had any experience in the promises, and with what success.

Mr. Schnitzelhuber, the German member, who is a Ph.D. from the fatherland, and a Chat. Photo. Gr. of his adopted country, here arose and stated that the overcoming of halation was an old story in Germany; that the latter process mentioned by Dr. Oxalate

was the true one, as had been shown by Dr. Eder years ago in his published experiments made with a flame of an argand lamp.

Mr. Dropshutter, an enthusiastic amateur, here arose and stated that he had gotten a dozen of American double-coated plates, and had exposed several in his mother-in-law's dining-room in front of two windows, the bright sunlight shining directly into the room. To give them a thorough test he had exposed six plates in succession, the time varying from ten minutes to one hour,—stop, *f*-22.5. He then attempted to develop them with pyro and soda, without success. He also made attempts with eikonogen and amidol, but all without result. After the plates were dense and black all over he had attempted to strip off the outer coating, thinking that perhaps the perfect negative was underneath, but he had been unable to separate the two films. He thought there must be something wrong in the accounts of these multi-films as published in the English papers.

The secretary here asked whether anyone present had tried the new backed plates.

Professor Gobler, who in his own estimation is the great authority on matters photographic, and who is always ready to air his opinions, here arose, and striking his favorite attitude, stated, "That to his personal knowledge the plates put on the market with non-halation backing were a delusion and a snare. He had been induced to buy a dozen of the new plates mentioned by Dr. Oxalate; he had exposed them all, and had absolutely nothing on the plate,—no image whatever. In fact the coating upon the plate was entirely too opaque for the lens to cut the image through, and that, scientifically-considered, the English principle of having a number of films one on top of the other, and which could be successively stripped off and developed until a satisfactory image appeared, was the only true principle.

Mr. Scribbler here ventured the question as to how the learned professor had exposed the backed plates.

The professor replied that it was hard to tell whether that question was asked in ignorance or for the purpose of confusing him. Assuming that the member in his ignorance was sincere and wanted information, he would inform the club that the new

domestic plate was coated on both sides; one side held the usual emulsion, the other a non-halation coating placed in optical contact with the surface, the purpose and aim of which was to intercept the excess of light and prevent its reaching the sensitized film upon the other side, but according to his experiments it was proven that this coating was either too dense or else not made strictly according to the true spectral analysis of the primary colors. Consequently the whole experiment was a failure, and for the information of the ignorant member he would state that the correct way to expose this sort of plate was to put the plates in the holder with the dark-coated side outward, as when they were placed in the holder same as an ordinary plate, an ordinary negative would result, as certainly anyone of any intelligence would know that nothing placed behind a plate would have any effect. Prof. Gobler further stated that he had not yet tried any of the foreign plates, but in future expected to confine himself exclusively to such brands.

Mr. Scribbler here again interrupted the speaker, and stated that there certainly was some mistake, as he had tried the new coated plate on several difficult interiors with excellent results, and had the negatives here to show that the evil of halation was overcome without any doubt by their use; further that he had exposed them in the usual way with the sensitive side toward the lens. In fact the prints were so fine that he was going to send them to the Chicago exhibition.

Prof. Gobler here stated that if he had so exposed the plates the results were merely ordinary photographs and nothing else, and he here repeated that to overcome halation by this process was to coat the plates with a non-halating medium, and then expose through the coating on the film.

A member then asked if a plate was so exposed whether the image would not be reversed upon the plate.

Prof. Gobler answered that the young member had better study up the science of non-halating-optics before asking so foolish a question.

The secretary then moved that the thanks of the Turkeytown Hypo Club be tendered to their fellow-member, Prof. Gobler, for

his valuable contribution to the theory of photography in his remarks on non-halation plates, and that the remarks be printed and sent to the photographic press for dissemination.

Adjourned. J. FOCUS SNAPPSCHOTTE.

LUNAR PHOTOGRAPHY.

IN AN article recently published in the *English Mechanic* upon double stars and other astronomical sublects, by Mr. S. W. Burnham, he takes occasion to reply to some of the statements which have been made regarding the alleged discoveries on the lunar negatives made at Mount Hamilton. We make the following extract:

"Referring to the Moon photographs taken at Mount Hamilton with a thirty-six-inch refractor, alluded to by 'F. R. A. S.,' and the question of alleged discoveries in the positives of 'rivers,' which have been called in question by M. Prinz, of the Royal Observatory at Uccle, I would suggest the best way of determining whether these details really exist is to examine the lunar surface under the same illumination with any convenient telescope. A very moderate aperture will be sufficient for the purpose. All that is shown on these or any other photographs of the Moon, can be seen with instruments in the possession of amateurs, and certainly many of them will show scores of details not found on the negatives. At present photographs of the Moon and planets, however large may be the aperture with which they were made, have only a pictorial value. They may be of some interest as showing general areas of the Moon, but cannot compete with other methods of delineating the details which are shown under favorable circumstances to the eye in apertures of six inches and upwards. The photographs of the Moon made with the Lick telescope, when compared with what can be seen with the eye with very much less optical power, are precisely the same as the photographs of Jupiter, Saturn, Mars, etc., when compared with what would be obvious to the eye with the same inferior instrument. To those who have made any photographic experiments in this line, who have examined or

with any care the results obtained by others, independent of the claims made of their scientific value, this is too obvious to admit of argument.

Nothing whatever is gained by enlarging an original negative, aside from making a picture which requires a less close inspection. Nothing in the way of details can be shown in the enlargement which is not found in the original. Of course it goes without saying that many details may be pointed out on these Moon negatives, and others taken with much smaller apertures, which are not shown in any drawings. Hundreds of minute markings could be noted by any skilled observer with a moderate telescope which he would be unable to find on any existing sketches, simply because no one has thought it worth while to reproduce them. These things are in no sense of the word *discoveries*, any more than a faint star shown on a long-exposed plate of the Milky Way is a discovery.

It may be mentioned here that the first series of Moon negatives with the Lick telescope running through an entire lunation, were made by me in 1888. Many of these have been reproduced in various publications since that time, and are familiar to most readers. Though not all of equal excellence, owing to the varied atmospheric conditions under which the exposures were made, many of them were as perfect as could be expected with such an instrument, and so far as I know, nothing better has been done since in the way of definition or otherwise. I have made an extensive use of these and other negatives made since that time for the reproduction of enlarged positives and negatives, lantern-slides, etc., and the views given above as to the scientific value of such an application of photography are based upon this work and a careful study of the results.

The time may come when we can make a picture of the lunar surface, or of a planet, as we see it with the same aperture through an eye-piece magnifying three or four hundred diameters; but now this seems a long way off. At present photography no more supplants the observer of planetary and lunar surfaces than it takes the place of the double-star observer in the discovery and measurement of stellar systems.—*Astronomy and Astro-Physics.*

ON THE THEORY AND PRACTICE OF INTENSIFICATION.

BY J. H. BALDOCK, F.R.S.

(*Continued from page 211.*)

WE pass to the second division of our subject, *i.e.*, intensification without previous bleaching, and for this purpose several chemicals are used, *e.g.*, lead, uranium, gold, platinum, biniodide mercury, and a solution made by the Platinotype Company, called the "Perfect Intensifier."

In using lead several precautions have to be taken, and as it is a troublesome process, and is moreover liable to cause fog, it is but seldom used. Its chemistry depends on the formation of the ferrocyanide of lead and silver, by reduction of the ferricyanide by metallic silver when the negative is treated with the following:

Lead nitrate	20 gr.
Potass. ferricyanide (clean)	30 gr.
Distilled water	1 oz.

Dissolve, filter, and acidulate with acetic acid. But as the ferrocyanides of lead and silver are *white*, they have to be blackened, after *very thorough* washing, with a dilute solution of ammonium sulphide, the first reaction being as follows:

$$2Ag_2 + 2Pb_3Fe_2(CN)_2 = Ag_4Fe(CN)_6 + 3Pb_2Fe(CN)_6,$$

the *white ferrocyanides* afterwards becoming *black sulphides*.

Instead of the ammonium sulphide, which is a very nauseous smelling body, and not an advisable adjunct to a dark-room, one of the potassium chromates may be used, in which case we obtain, instead of the black color, a *red* one if the dichromate is employed, and a *yellow* one if the chromate is used.

With the uranium intensifier an analogous action takes place, only that as the uranic ferrocyanide is of dark brown or chocolate color, the subsequent application of a darkening agent is in this case unnecessary.

The solutions suitable for the purpose are those now commonly employed for producing warm tones on bromide paper, and are as follows:

No. 1.

Uranium nitrate	20 gr.
Acetic acid	½ oz.
Water up to	10 oz.

Dissolve.

No. 2.

Potassium ferricyanide (clean)	20 gr.
Acetic acid	½ oz.
Water up to	10 oz.

Dissolve.

Mix these two solutions in equal proportions, and let the *very thoroughly* washed negative soak in it till the desired color is attained. Should the action go on too far, a *careful* application of a *weak* solution of ammonium carbonate will weaken it, care being taken not to use a strong solution or allow it to act too long, or the image may disappear altogether.

The next intensifier is simplicity itself. A solution is carefully prepared as follows:

Mercuric chloride	1 dr.
Potassic iodide	3 dr.
Distilled water	12 oz.

Dissolve.

The quantity of iodide being *just exactly sufficient* to re-dissolve the brilliant scarlet precipitate first thrown down. Into this solution the negative, first well soaked, is placed, until the desired effect is attained, after which it is well washed. Objections, it is true, have been urged against this method, in that the image resulting from its use is, or may be, subsequently affected by the action of light.

Similar objections have been raised in regard to the uranium process, but we believe the supposed effects have been, in both cases, exaggerated.

In the case of gold and platinum the change is of the simplest character, one or other of these metals being substituted for the original silver, according to the following equations.

Gold . . . . . $3Ag_2+2AuCl_3=Au_2+6AgCl$
Platinum . . . . . $2Ag_2+PtCl_4=Pt+4AgCl.$

The last intensifier in the second division is the " Perfect Intensifier " of the Platinotype Company; the composition of this is, of course, a secret, but Captain Abney states that it contains mercuric chloride and a salt of platinum. We can speak from actual experience of the excellence of this intensifier, and also as to the easy and cleanly way in which it can be used. The process is simplicity itself. The first thing to do is to soak the plate in alum solution acidulated with hydrochloric acid, for the purpose, as previously explained, of removing all traces of hypo. Wash well, and immerse in the intensifier, somewhat diluted with water, until the desired effect is obtained. The action, quoting Captain Abney again, is gradual and effective, and seems to be unaltered by time.

We now come to the third division of our subject, *i.e.*, intensification by re-development. In this, as in all previous cases, the first step consists in the thorough removal of all traces of hypo by means of the acidulated solution of alum and thorough washing. The negative is then bleached in an aqueous solution, cold and saturated, of mercuric chloride, to each ounce of which two or three minims of strong hydrochloric acid have been added; this is preferable to employing a solution of mercuric chloride with potassic bromide or ammonium chloride, as is frequently done. When thoroughly bleached and well washed, the negative may be developed after the manner of a newly-exposed plate by most of the developers in common use. We have not had time to try them all, but may say that amidol appears to give a slight increase of density, is clean in use, and gives a clear and quick-printing negative. Hydroquinone gives greater density, is also easy and clean to use, and produces a clear, good printing negative. In one case in which we tried it, and accidentally left the negative in too long, we got the orange hydroquinone stain,

exactly as would have happened to a recently-exposed and newly-developed plate.

But perhaps the best method is that of the ferrous-oxalate development, which is strongly recommended by Prof. Meldola, Chapman Jones, and others. In the first place it is simple, and then again a considerable increase of density is obtained, because all the silver and mercury present in the film is left behind in the metallic state, and lastly, like the sodium sulphite method, it can be repeated over and over again till the necessary opacity is obtained.

The solution used should be 1 part of the saturated solution of ferrous sulphate to 6 parts of the saturated solution of potassium oxalate, and it is essential that both solutions should be acid. Sulphuric, acetic, or oxalic acid may be employed for this purpose, and 3 or 4 parts of water. No bromide is required.

The previously bleached negative is allowed to soak in this till the image is blackened right through to the back, and is then well washed. It is desirable that the first washing waters should be acidified with hydrochloric or acetic acid (as is done in developing bromide paper) to prevent the precipitation of any iron salt, or lime from the water.

The reaction which takes place here may be represented by the following equations:

Silver Chloride.	Ferrous Oxalate.	Potassium Oxalate.	Silver.	Ferric Oxalate.	Potassium Chloride.
1.—$2AgCl$	$+ 2FeC_2O_4 +$	$K_2C_2O_4 =$	$Ag_2 +$	$Fe_2(C_2O_4)_3 +$	$2KCl$

Mercurous Chloride.	Ferrous Oxalate.	Potassium Oxalate.	Mercury.	Ferric Oxalate.	Potassium Chloride.
2.—Hg_2Cl_2	$+ 2FeC_2O_4 +$	$K_2C_2O_4 =$	$2Hg +$	$Fe_2(C_2O_4)_3 +$	$2KCl.$

We have thus endeavored, so far as the time at our disposal will allow, to pass in somewhat hurried review some of the principal processes employed in the intensification of negatives and to indicate the chemical change involved in these processes, and it is in such work as this that a knowledge of chemistry comes in useful for the purpose of teaching us not only what to do, but why we do it, and to this end we hope the paper we have had the honor and pleasure of laying before you may have contributed.

ELEMENTARY OPTICS.

(*Continued from page 227.*)

If we take a piece of glass, flat one side and cut into different faces on the other, and then look through it from the flat side at any object—for instance, a pea—we shall see as many peas as there are faces receiving rays from the single pea. We may exemplify this principle of multiplication by the annexed figure (Fig. 11), in which A B is a lens flat on one side, and cut into three faces on the other, G H. Y is the eye of the spectator, and P the pea to be looked at. The eye receives a pencil of rays direct through the lens at I, and sees the object without refraction. A pencil also proceeds from P to face G A, and another pencil proceeds from C to the face H B, and in both cases the rays are bent and refracted to the eye. This eye, however, does not recognize the path of either of these oblique rays, but perceives the image of a pea at D and at F; and thus three peas seem to be seen in place of only one.

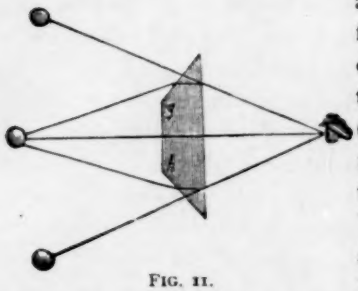


FIG. 11.

In smoothly ground lenses, in which there are no distinct faces to multiply the images of an object, the rays bend, as we have said, so as to meet in a corresponding point beyond them. A lens may consist of a perfect globe of glass filled with pure water, in which case the refractive power will be considerable. A double convex lens, which is the more common kind, may be viewed as a portion cut out of the side of a sphere, as seen in Fig. 12. Here, as in all cases of convexity, the focus of the parallel rays passing through the lens is at F, which is the centre of the sphere, of which the farther, or anterior side, is a portion, or a point at half the diameter of the sphere from it. (Half the diameter is technically called the *radius*.) Should we take a plano-convex lens, the focal

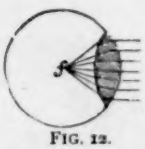


FIG. 12.

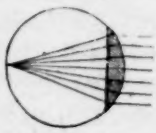


FIG. 13.

point would be considerably different. In Fig. 13 we have an example of this kind of lens, which evidently possesses only half the refractive power of the double convex glass. Here the parallel rays, falling on the convex side of the lens, are seen to converge at the distance of the whole diameter of the sphere. Thus, the focal point at which the rays of light fall is always regulated by the degree of curvature of the lens. I shall illustrate this by various diagrams, and ask the reader's careful attention, for the subject is difficult, and cannot be comprehended by a superficial glance.

We take a double convex lens, represented by A B C (Fig. 14), the axis of which is the line G′ C D′. The ray D′ G′, being straight through the centre, suffers no refraction; but the rays D A and D″ B are refracted, so as to meet at the focal point G′ We now observe that the parallel rays E A, E′ C, and E″ B, and also F A, F′ C, and F″ B, falling obliquely on the lens, will, in a similar manner, be refracted, and have their foci at G and G″, at the same distance from the lens. Those lines which pass through the centre, as E′ C G″ and F C G, do not alter their direction, not being refracted. Thus, in whatever way parallel rays pass through a lens, we have a focal point beyond it, be it straight forward or in an oblique direction.

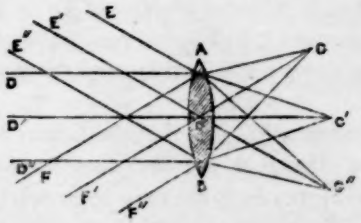


FIG. 14.

The distances at which the rays meet beyond the lens is exemplified in the next diagram (Fig. 15). Dr. Arnott, in his Treatise

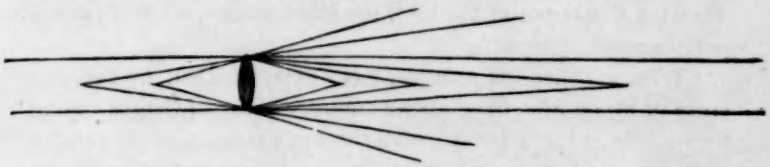


FIG. 15.

on Physics, says: "Rays falling from A on a comparatively flat or weak lens at L, might meet only at D, or even farther off,

while, with a stronger or more convex lens, they might meet at C or at B. A lens weaker still might only destroy the divergence of the rays, without being able to give them any convergence, or to bend them enough to bring them to a point at all, and then they would proceed all parallel to each other, as seen at E and F; and if the lens were yet weaker, it might only destroy a part of the divergence, causing the rays from A to go to G and H, after passing through, instead of to, I and H, in their original direction.

"In an analogous manner, light coming to the lens in the contrary direction from B C D, etc., might, according to the strength of the lens, be all made to come to a focus at A or at L, or in some more distant part; or the rays might become parallel, as M and N, and therefore never come to a focus, or they might remain divergent.

"It may be observed in the annexed figure, that the farther an object is from the lens, the less divergent are the rays darting from it towards the lens, or the more nearly do they approach to being parallel. If the distance of the radiant point be very great, they really are so nearly parallel that a very nice test is required to detect the non-accordance. Rays, for instance, coming to the earth from the sun, do not diverge the millionth of an inch in a thousand miles. Hence, when we wish to make experiments with parallel rays, we take those of the sun.

"Any two points so situated on the opposite sides of a lens, as that when either becomes the radiant point of light, the other is the focus of such light, are called conjugate foci. An object and its image formed by a lens, must always be in conjugate foci; and when the one is nearer the lens, the other will be in a certain proportion more distant.

"What is called the *principal* focus of a lens, and by the distance of which from the glass we compare or classify lenses among themselves, is the point at which the sun's rays—that is, parallel rays—are made to meet; and thus, by holding the glass in the sun, and noting at what distance behind it the little luminous spot or image of the sun is formed, we can ascertain the solar focus of a glass, as at A for the rays E and F."

From the preceding explanations it will be understood, that when an object is placed at any distance from a lens, an image of it will be formed in the corresponding conjugate focus; but to see this image distinctly, the eye must generally be placed at least six inches behind it, that is, farther from the lens. When, however, the object is placed in the principal focus, the rays are refracted parallel, and the image in this case is distinct when seen at any distance. But the most remarkable quality of a double convex lens remains to be noticed; we allude to its magnifying power. This quality is entirely a result of the refractive power of the glass; embraced within the sphere of the rays from the lens, the object is apparently expanded in size, and seems brought nearer to the eye. This may be elucidated, for small objects seen near, by a reference to the diagram (Fig. 16).

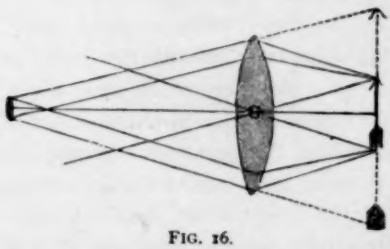


FIG. 16.

Let E be the eye, and M N the diameter of its pupil, R W a small object placed at the least distance of distinct vision (about six inches from the eye for small objects), and let R W be its apparent size when seen by the unaided eye. If a convex lens A B is now interposed between the eye and the object, so that the object R W shall be in the principal focus of the lens, an enlarged image R′ W′ of the arrow will then be seen, its extremities R′ W′ lying in the directions E A, E B. The directions of these rays are determined thus: From R and W draw the central rays R C P, W C Q through the centre C of the lens; then the rays of the conical pencil, proceeding from the point R to every point of the nearer surface of the lens, are refracted in such a manner by the lens, that they will emerge in directions parallel to the central ray R C P; but of the whole refracted pencil only a small portion enters the eye, namely, the pencil A M N A, limited by the size of the pupil M N; and the head A of the arrow, whence this pencil proceeds, appears to lie in the direction of the pencil E A R′ at R′. It is shown exactly in the

same manner, that the point W will appear in the direction E B W′ at W′. The enlarged image of the small arrow R W is therefore R′ W′. The proportion in which the image is enlarged will be easily ascertained thus: The triangles E R′ W′, C R W, are similar, and therefore the ratio of R′ W′ to R W, is that of E R′ to C R, or of E M to C M; that is, as the least distance E M of distinct vision, to the focal length C M of the lens. If, therefore, the least distance of distinct vision be divided by the focal length of the lens, the quotient will be its magnifying power. If E M be reckoned 6 inches for small objects, and if the focal length C M be 2 inches; then, since 6, divided by 2, gives 3 for a quotient, the magnifying power is 3 times. If C M were one-quarter of an inch, then 6, divided by ¼, gives 24 for a quotient, and the magnifying power would in this case be 24 times.

The inversion of the image by a lens may be illustrated by the diagram (Fig. 17). A B C is an arrow, with the point uppermost, placed beyond the focus at F, of a double convex glass *d e f*. In virtue of the refractive power of the lens, the rays which proceed at A meet at Z, and form an image of the arrow-point inverted, while the rays from C meet at X, and form a similarly inverted image of the latter part of the arrow. The rays extending from B unite at *b*. Here, only the lines A, B, and C are represented, for the sake of clearness; but, in point of fact, rays from all parts of the object proceed through the lens, and hence an entire image is formed in an inverted position. Should the object A B C be brought nearer the lens, the image will be removed to a greater distance, because then the rays are rendered more divergent, and cannot so soon be collected into corresponding points beyond. To procure a distinct image, the object must be removed farther than the focal point F from the glass. In this exemplification, the object seems to be diminished; but if we make the small arrow the object, the larger one will be the image of it magnified.

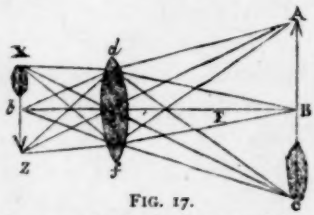


FIG. 17.

PHOTOGRAPHIC PAPERS OF THE WORLD'S COLUMBIAN EXPOSITION.

THE committee of the World's Congress Auxiliary on a Congress of Photographers announce that the following persons have accepted the invitation of the Committee on a Congress of Photographers, to prepare papers upon subjects, as stated below, to be read at the Congress which commences at Chicago on the 31st of July, and closes on the 5th of August:

"Amateur Photography," Catharine Weed Barnes, New York.

"America's Share in the Development of Photography," Julius F. Sachse, Editor of AMERICAN JOURNAL OF PHOTOGRAPHY, Philadelphia, Pa.

"Astro-Photography," Prof. E. E. Barnard, of Lick University, Mount Hamilton, Cal.

"Coarse Grained Negatives and How to Prevent Them," by M. A. Seed, St. Louis.

"Color Photography," Fred E. Ives, Philadelphia, Pa.

"Electric Lighting in the Studio," Henry Vander Weyde, London, England.

"Fine Line Screens and Their Use," M. Wolfe, Dayton, Ohio.

"Focometry Applied to a Particular Type of Lens-System," Thomas R. Dallmeyer, London, England.

"Isochromatic Photography," G. Cramer, St. Louis, Mo.

"Landscape Photography," W. H. Jackson, Denver, Col.

"Marine Photography," Henry G. Peabody, Boston, Msss.

"Medical Photography," Ellerslie Wallace, M.D., Philadelphia, Pa.

"Orthochromatic Photography and its Practical Application," John Carbutt, Philadelphia, Pa.

"Orthochromatic Photography and the Artistic Tendency of 'Platindruck' in Photography," Charles Scolik, Vienna, Austria.

"Photographers' Efforts at Union," H. Snowden Ward, London, England.

"Photography in Natural Colors," Edward Bierstadt, New York.

"Photography Without Objectives by Means of a Little Aperture," Captain R. Colsoy, Assistant Professor Polytechnique School, Paris, France.

"Photography in Anthropological Work," Prof. Frederick Starr, Chicago University, Chicago.

"Photography in Surgery," Mrs. G. F. Shears, M.D., Chicago, Illinois.

"Photography Applied to Scientific Research," Romyn Hitchcock, Washington, D. C.

"Photography as an Aid to Medicine," Prof. Albert Londe, Paris, France.

"Photographic Optics," Dr. Adolph Miethe, Rathenow, Germany.

"Photo-Micrography," H. G. Piffard, M.D. New York.

"Photo-Mechanical Processes in England," W. T. Wilkinson, Manchester, England.

"Photogravure," Ernest Edwards, New York.

"Portraiture," Sharpoor E. Bhedwar, Bombay, India.

"Posing and Illumination," E. Estabrooke, Elizabeth, N. J.

"Subject Relating to Photo-Mechanical Processes," Professor Jacob Husnik, Prague, Austria.

"Shutter Photography," Prof. N. Gray Bartlett, Chicago.

"The American Bibliography of Photography," C. W. Canfield, New York.

"The Desirability of an International Bureau, Established (1) to Record, (2) to Exchange Photographic Negatives and Prints," W. Jerome Harrison, Manchester, England.

"The Finer Division of the Silver Haloids for Scientific Work," Thomas W. Smillie, of the Smithsonian Institute, Washington, D. C.

"The Hand Camera: Its Aim and Objects," Walter D. Welford, London, England.

"The Present and Future Possibilities of Photography," W. I. Lincoln Adams, N. Y.

"The Present and Future Possibilities of Photography, Leon Vidal, Paris, France.

"The Sensitiveness of Photographic Plates," Prof. G. W. Hough, Northwestern University, Evanston.

"The Services of Photography to Medicine," Andrew Pringle, Cromwell House, Bexley Heath, England,

The following persons have signified their acceptance of the invitation to prepare papers, but the subjects of their papers have not been announced:

Bausch, Edward, Rochester, N. Y.
Burton, W. K., Prof. Imperial University, Tokyo, Japan.
Giffard, W. M., Honolulu, H. I.
Nicol, Dr. John, Tioga Centre, N. Y.
L. M. Davies, Johannesburg, Africa.
Miss Adelaide Skeel, Newburgh, New York.

A WORKING FORMULA FOR GELATINE DRY PLATES.

AT the meeting of the Photographic Society of Great Britain, April 25th, Mr. J. Desire England, gave an interesting and valuable demonstration of the manufacture of gelatine plates; the lecturer stated that when great rapidity is not required, the process was not difficult, and should be interesting to the amateur. He gave two formulas; one for the boiling process ran as follows:

A.—Bromide of potassium	90 grains.
Iodide of potassium	3 grains.
Gelatine (Nelson's No. 1)	20 grains.
Water	1½ ounces.
Hydrochloric acid	1½ minims.
B.—Nitrate of silver	120 grains.
Distilled water	2½ ounces.

Both solutions are heated at 110° or 120° Fahr., and B is then allowed to trickle into A by lightly stuffing the neck of a funnel with moistened cotton-wool, and pouring the solution through that. The lower solution is stirred continually until the mixing is complete. A drop of the emulsion poured on to a slip of glass

is now seen to transmit red light. The emulsion is boiled, and a drop taken out and examined occasionally until the original color has passed through violet to blue or green. If carried beyond that it becomes grey, and yields a foggy image. When sufficiently boiled and cooled to about 130°, 150 grains of hard gelatine that has meanwhile been soaking in water to swell is added, and dissolved by stirring. It is next left to set, and, when thoroughly firm—ice may be necessary in very hot weather—the lump of jelly is squeegeed through mosquito netting held under water so as to divide it into shreds. After thorough washing and draining, the emulsion is melted at a heat of not more than 110°, and 5 per cent. of methylated spirit is stirred in. Next, a little chrome alum solution is stirred in. The emulsion will bear from one-eighth to one-quarter of a grain of chrome alum to the ounce. Swans-down-cotton tied over a lamp-chimney was recommended as a filter for small quantities. Plates were coated with an emulsion which had been thus prepared in the presence of the audience. For a somewhat more rapid plate, an emulsion was made containing ammonia. The formula given was one by Mr. Henderson, as follows:

A.—Nelson's No. 1 gelatine	20 grains.
Ammonium bromide	180 grains.
Ammonium iodide	3 grains.
Water	4 ounces.
B.—Nitrate of silver	240 grains.
Water	4 ounces.

Convert the silver into ammonia nitrate by stirring in liquor ammonia (880°) until the brown precipitate first formed is just redissolved. The solutions are mixed in the same way as for the boiling process, but the temperature must not exceed 130°, and is better kept down to about 110°. 180 grains of hard gelatine is added directly after mixing, and when dissolved, the jar is placed in a vessel containing three quarts of water at 130°, and allowed to cool spontaneously.

A discontented man is like a snake who would swallow an elephant.

The Editorial Dropshutter.

Who First Applied Bromine in Daguerreotyping.—Our esteemed British namesake, in its issue of April 28th, publishes the following comment upon our Summary, read before the Franklin Institute some months ago, and which has lately been published in pamphlet form by the Institution before which it was read. Thus far nothing has been produced, to affect our claim that the first portrait by the photographic process was made in Philadelphia. By reference to the dates and authorities given the same will be found to hold good as regards the use of bromine. We invite attention to our trans-atlantic brother's comment.

A MATTER of much interest in reference to historical photography has been brought before the Franklin Institute (an American Society, something like our Society of Arts, only more technical) by Mr. Julius F. Sachse, who brings a second Richmond into the field. Here have we, and all the world, for these vast number of years, been quietly reposing in the belief that the first man who applied bromine in the sensitising of Daguerreotype plates, and by which that process was rendered sufficiently sensitive to enable portraiture to be easily possible, was J. F. Goddard, a lecturer in the Royal Polytechnic Institution of London, and who, between thirty and forty years ago, received fairly handsome recognition of his discovery after a long delay. Now, says in effect this Franklin Institute Iconoclast, you have been altogether wrong, for it is an American discovery. We have read Mr. Sachse's paper carefully, and in all fairness must state that the claim he has put in on behalf of Philadelphia having been early indeed in developing photography, seems just. He has arrayed a large number of facts, notes, and dates. From these we learn that another Goddard—not ours, but Dr. Paul Beck Goddard, of Philadelphia—in December, 1839, produced perfect specimens of the Daguerreotype, through the agency of bromine as an accelerator, and proof of this is adduced by reference to vol. iii., page 180, of the *Proceedings of the American Philosophical Society*, to which we have no present means of obtaining access. Now, it was in the autumn of the year following that our Goddard (curious coinci-

dence of names) made his discovery, and published it in the *Literary Gazette* of December 12th, 1840, and two months later (February, 1841) deposited a paper in the Archives of the Royal Society, detailing his sensitive process of bromine with iodine, for taking portraits from life by the Daguerreotype process. Be it understood that we are not here discussing the question as to who was the first to use bromine in photography in general, so far as it existed in those days—for that honor belongs, unquestionably, to Fox Talbot, who published his discovery nine months previous to the date claimed for the earliest of the other rivals—but who first applied it to the Daguerreotype? It is curious that both these should, although unrelated, bear a similar name, and that both should have been experimenting in a similar direction. It is highly suggestive of the simultaneous discovery of the planet Neptune by Leverrier, of Paris, and Adams, of Cambridge. Mr. Sachse further gives a facsimile of what is believed to be the first portrait ever made by the Daguerrotype process, which was taken by Robert Cornelius, in Philadelphia, November, 1839. But, as we recorded only a few weeks ago (April 7th, page 211), the "first" portrait Daguerreotype, which is now on its way for exhibition at the World's Fair at Chicago, and which was taken in New York by Professor Draper in 1840, interposes an element of disturbance, for, if the Philadelphia history be correct, the New York one cannot be so, and *vice versâ*. The subject is not likely to cause a war between the "Empire City" and the "City of Brotherly Love," but the photo-archæologists of these rival cities must somehow have the matter settled. To do this once and for ever ought not to prove a very difficult matter.

American Philosophical Society.—The venerable Frederick Fraley, on the occasion of the opening of the session of the Sesqui-Centennial Celebration of the American Philosophical Society of Philadelphia, paid a glowing tribute to the memory of the late Dr. Paul Beck Goddard and his connection with the early development of photography. The absence of Captain Abney, who is the representative of the Royal Institute of England, at this meeting, was a matter of much regret.

Exhibition Echoes.

The Centre of Photography.—Philadelphia, says the *Public Ledger*, is the centre of photography in the United States, and has the distinction of having done more to develop the art in its infancy than any other place. It was here the first heliograph or daguerreotype in America was made, and here the first portrait in the world taken by this progress was made. The originals of both of these are still in existence; the former is a view of the old Boys' High School on Juniper street, taken by Joseph Saxton, and is in the Historical Society's collection, and the other was taken by Robert Cornelius, and is a portrait of himself.

Facsimiles of these interesting works have been loaned for exhibition by the owner. They offer a contrast to the best modern work that speaks eloquently for the development of the art which was only discovered by Daguerre in 1839. The Frenchman was the Columbus of the art, but it is singular to relate he did nothing more for it, and for years America, and particularly Philadelphia, remained in the lead. With the inculcation of the artistic spirit another change came, and England now appears to occupy the first place, although there are half a dozen Americans who are perhaps equal, and certainly not far behind in the race.

Development of the Picture Idea.—The most apparent thing in the display is the effort the photographers are now making to produce pictures. The day when the photograph was simply a graphic record of an interesting occasion seems to have passed. Artists have taken hold of it, and put into it the artistic spirit which the professional photographer lacked, and as a result it now appears in the nature of a new art. It was generally believed that there were great possibilities for the art in the hands of artists, but it is safe to say that only the few had any adequate idea of the wonderful advances made in this direction until this exhibition, which is an international one, dawned on them.

For some purposes the camera is better than an artist's pencil, and many artists are ready to acknowledge its assistance. In the printing from the negative there are great opportunities for skilled and artistic work; in fact, some of the most charming effects in the exhibition are due almost wholly to the printing. This fact was so evident to one of the artists on the Board of Judges that he is reported as saying he did not see any need for him to do any more black-and-white work.

Society Notes.

The Photographic Society of Philadelphia.—At the Annual Meeting, held April 12th, 1893, the Monthly as well as the Annual Report of the Board of Directors was read and adopted. The treasurer's account showed a total balance to the credit of the society of $1183.98. At the May meeting, Mr. Edmund Stirling read a paper upon the Lantern. Prof. Sharp showed a number of slides of scientific subjects used during his course of lectures last winter. Announcements were also made of the Standing Committees for the current year.

Photographic Society of Japan.—A regular meeting of the above mentioned Society was held at the rooms of the Geographical Society (Chigaku-Kiokai) Nishikonya-cho, Kiobashi, Tokyo, beginning at 5 p. m., on Friday the 14th of April, Mr. Edmund R. Holmes in the chair.

The following gentlemen were unanimously elected members of the Society: — Messrs. W. Silver Hall, N. Kasuga, S. Kikkawa, W. B. Mason, M. Naito, K. Narahara, and K. Tatsuke.

Mr. T. Kiyokawa presented samples of blue printing paper, of his own manufacture, to the Society, and these were distributed amongst members for trial.

Mr. B. Munster showed farther examples of the work of J. Carpenter's Opera-Glass camera. These were very beautiful, and were greatly admired.

Mr. S. Nonogaki sent a couple of pin-hole photographs. Mr. Nonogaki was not present, but it was understood from a letter he had sent, that he had made the pin-hole plates himself, having read the communication to the Society on the subject by M. J. Favre-Brandt. The definition of the photographs shown was so good that it was hardly possible to believe that they had not been taken by a lens, but in looking at them very carefully the characteristic pin-hole "softness" could be seen.

Mr. W. K. Burton and K. Arito showed a sensitometer they had been using in an investigation with regard to the power of compensating, in development, for variation in exposure. Long strips cut from dry plates were exposed in this sensitometer, to direct light, were afterward longitudinally cut in two, and the two halves were shown, proving the power of compensating for exposures varying as several hundred to one.

Photographic Hints and Formulæ.

Coating Zinc Trays.—Zinc trays can be made useful for photographic purposes by coating them with a solution of

Bitumen Judea	5 grams.
Benzol	100 c.cm.

Place the coated vessel in the sunlight, in order to render the coating insoluble.—*L'Amateur.*

Sodium sulphate, or glauber salts, are now recommended in place of sulphite, by a German authority.

Alcoholic Solutions.—Mr. C. Weitenkampf, of Berlin, describes a process for the separation of solid and liquid substances dissolved in alcohol, ether, or chloroform, without evaporating the solvent. The solution is first cooled to a temperature of about 20° to 25° C., is then saturated under a pressure with carbonic acid, and is lastly made to pass through filtering materials, *e.g.*, charcoal or cellulose, by which the substances to be separated are dissolved.

Restoring Faded Silver Prints.—Remove the print from the mount, soak in water, and immerse in a solution of neutral chloride of gold and potassium (3 to 4 grains of gold to 4 ounces of water) till the desired tone is obtained.

Wash in subdued light; clear and wash carefully again.

H. Sandaurek, for this purpose, advises the preparation of the following two baths:—

(I).	Tungstate of soda . . .	100 grams or 3½ ounces.
	Distilled water . . .	5,000 c.c. or 175 "
(II).	Carbonate of lime (C. P.) . .	4 grams or 62 grains.
	Chloride of lime	1 " or 15½ "
	Chloride of gold and sodium	4 " or 62 "
	Distilled water	400 c.c. or 12 "

Solution 2 is made in a yellow glass bottle, well stoppered, and allowed to stand for twenty-four hours before use. It is then filtered into another bottle of yellow glass, and to preserve it well corked. To use, say, for a sheet of albumen paper, take 150 c.c. or 5½ ounces of (I.), to 4 to 8 c.c. or 1 to 2 drams of (II.).

The prints, well washed, are placed one at a time in this bath. The strengthening must not be too rapid, ten minutes being sufficient in

summer, and the bath must not contain an excess of chloride of gold. Properly used, a beautiful clear purple color is obtained.

To clear the prints take 150 c.c., or 5¼ ounces of solution (I.), to 15 c.c. or 4 drams of hyposulphite of soda. The strengthened prints are well washed, placed in this bath one at a time, and soaked until the yellow color is entirely gone, which requires, in some cases, three to five hours, when they are again thoroughly washed.— *Photographic Work.*

Solution of Gold in Potassium Cyanide.—Mr. R. C. Maclaurin, in a communication to the Chemical Society, points out that the study of the conditions contributory to the dissolution of gold in solutions of potassium cyanide is become of importance, owing to the recent use of this agent in extracting gold from poor ores. The nature of the changes is disputed. Elsner originally expressed the interaction by the equation $4Au+8KCN+O_2+2OH_2=4AuCN\cdot KCN+4KOH$; but McArthur, in a recent paper, has called in question the necessity of oxygen being present. It is a remarkable fact in connection with the process that the rate of dissolution of the gold decreases as the concentration of the cyanide solution increases. It is shown that dissolution of the metal is conditioned by oxygen, and that the amounts of oxygen absorbed and gold dissolved are in the ratio O : 2Au. Furthermore, it is shown that the rate of dissolution varies with the strength of the solution, and that it passes through a maximum in passing from dilute to concentrated solution; this variation is traced to a decrease in solubility of oxygen in solutions of potassium cyanide as the concentration increases.

Ebonizing Wood.—An excellent method to stain wood a permanent black is to dip the finished pieces in a solution of aniline black in water, to which a small quantity of chloride of copper has been added. When dry, coat with a solution of bichromate of potash in water; apply with sponge or brush. On repetition of the operation two or three times the wood is stained a clear, permanent black.

Water-Proof Glue.—Dissolve

Gum sandarach	10 g.
Gum mastic	10 g.
In alcohol	150 cc.m.

When dissolved, add turpentine 10 g.; then bring mixture to a boil in a regular glue-pot, and add while boiling, with constant stirring,

Glue	10 g.
Isinglass	10 g.

Filter hot through a cloth.

Lead Toning Bath.—A simple toning solution without the use of gold, which is said to give good results, is as follows:

Hyposulphite soda	32 drachms.
Acetate of lead	4 drachms.
Distilled water	20 ounces.

Print until all the detail is well out in the shadows, then immerse in toning and fixing bath without previous washing.

Combined Toning Bath.—A toning bath containing the salts of lead and gold, and which is said to give rich, velvety blacks, has lately been published. The great drawback to it, however, is that it will not keep, the solution having to be mixed as needed, and used at once.

Nitrate of lead	30 grains.
Chloride of sodium	40 grains.
Chloride of gold	1 grain.
Hyposulphite of soda	4 drachms.
Hot distilled water	10 ounces.

After toning fix prints in fresh hypo as usual.

Silver Stains on Plates.—The following solution is said to remove silver stains from plates without injury to the negatives:

Bichromate of potash	5 grs.
Chloride of sodium	20 grs.
Water	1 oz.

Soak the stained plate in above, and after washing, flow with

Sulphocyanide of ammonium	20 grs.
Water	1 oz.

A Novel Photographic Mount.—Among the recent inventions in Germany is one which relates to the production of what is known as metallic paper, that is, thin sheets of metal pasted upon a paper backing. The improved process consists in employing as the cathode in an electrolytic bath a well-polished sheet of brass or nickel, which has been previously rubbed over with a solution of higher alkaline sulphide or hydrosulphide, with a small proportion of grease solvent, such as spirit. The plate is immersed in a neutral solution of sulphate of copper, and afterward in an acid copper bath for electroplating. After this the plate is immersed in a sulphate of zinc bath, removed therefrom, and slightly treated with a solution of ammonium hydrosulphate mercaptan, or a similar compound. It is now covered with paste mixed with glue, and the paper pasted thereon, after which the paper-backed metal sheet is stripped from the foundation plate. The cost of sheets produced by this process is stated to be about three cents each, instead of about 25 cents, the cost heretofore.

The use of this new paper it is expected will work quite a revolution in photographic reproductions, both mechanical and heliographic, as by the use of aluminum sheets it will be possible to produce effects similar to the old argentotype, which was one of the most beautiful of the old processes, and consisted of floating a carbon tissue upon a sheet of highly-polished silver.

A "Photo-Corrector" has been invented, and is in practical use by an English artist, by which the dimensions of any part of a photograph can be altered, "and the whole made harmonious." A person five feet and a half in height can be made to look five feet high or six feet high, as desired, and hands, feet, or any other part can be similarly corrected. The Society of Arts is to be told all about the invention by the inventor next month.—*The Canadian Photographic Journal.*

Coloring Brass.—A cold method of coloring brass a deep blue is as follows: 100 grams of carbonate of copper and 750 grams of ammonia are introduced into a flask, well corked, and shaken until solution is effected. There are then added 150 cubic centimeters of distilled water. The mixture is shaken once more, shortly after which it is ready for use. The liquid should be kept in a cool place, in tightly-closed bottles or in glass vessels, with a large opening, the edges of which have been subjected to emery friction and covered by plates of greased glass. When the liquid has lost its strength it can be recuperated by the addition of a little ammonia. The articles to be colored should be perfectly clean; especial care should be taken to clean them of all traces of grease. They are then suspended by a brass wire in the liquid, in which they are entirely immersed, and a to-and-fro movement is communicated to them. After the expiration of two or three minutes they are taken from the bath, washed in clean water, and dried in sawdust. It is necessary that the operation be conducted with as little exposure to the air as possible. Handsome shades are only obtained in the case of brass and tombac—that is to say, copper and zinc alloys. The bath cannot be utilized for coloring bronze, copper-tin, argentine, and other metallic alloys.—*Chem. Tr. Jour.*

Unbreakable Graduates.—Graduates are now made in Germany of celluloid, especially for traveling photographers and tourists. These graduates are transparent, and graduated same as the familiar glass apparatus, and have the advantage of being unbreakable, an advantage which will be of great service to the photographic public.

In the Twilight Hour.

A SERVANT should know more than he tells.

THE way to good manners is never too late.

TRUTH is more of a stranger than fiction.

WHEN a man's temper gets the best of him, it reveals the worst of him.

A BAD temper is an awkward thing to have and a dangerous thing to lose.

ART must anchor in nature, or it is the sport of every breath of folly.—*Hazlitt.*

A DOCILE disposition will, with application, surmount every difficulty.—*Manlius.*

ABUSE is one of the few things a man can have without earning or deserving it.

THERE is no surer way of having everybody's help than by trying to help everybody.

SELFISHNESS is the meanest and most contemptible of all vices—other people's selfishness, that is.

HE THAT cannot forgive others breaks the bridge over which he must pass himself; for every man has need to be forgiven.

IN THE bottle, discontent seeks for comfort; cowardice for courage; bashfulness for confidence; sadness for joy; and all find ruin.

FEW are sufficiently sensible of the importance of that economy in reading which selects, almost exclusively, the very first order of books. Why, except for some special reason, read an inferior book, at the very time you might be reading one of the highest order?

WRONG is but falsehood put in practice. —*Penn.*

EVERY one can master a grief but he that has it.

VIRTUE often itself offends when coupled with bad manners.

HE who wishes to do evil will never be at a loss for a reason.

THE pyramids themselves, doting with age, have forgotten the names of their founders.—*Fuller.*

PERFECT virtue is to do unwitnessed what we should be capable of doing before all the world.—*La Rochefoucauld.*

NO man is born wise; but wisdom and virtue require a tutor, though we can easily learn to be vicious without a master.—*Seneca.*

DO not that yourself which you are wont to censure in others. It is bad when the censure of the teacher recoils upon himself.

IF YOU cannot be happy in one way, be in another, and this facilty of disposition wants but little aid from philosophy, for health and good humor are almost the whole affair. Many run about after felicity, like an absent man hunting for his hat, while it is in his hand or on his head.

THERE is no such thing as utter failure to one who has done his best. Were this truth more often emphasized there would be more courage and energy infused into sad and desponding hearts. The compensation may seem shadowy and afar off but it is not so. It attends everyone who is conscientious, painstaking and resolute, and will not desert him, whatever may be the fate of his exertions in other respects.

Literary and Business Notes.

WE have received notice of the death of Mons. Emile-Andre Letellier, photographer, at Paris, France, April 10th, 1893. The deceased was an Officer de Académie, President et Member d'honneur de Plusieures Sociétés, etc.

"THE DEVELOPER."—The latest photographic journal to come to our notice is a new monthly under above title. It is published at 56 Vesey St., New York, and claims to be the official league of amateur photographers. The paper, typographical work, and illustrations are excellent. The unique cover is also an attractive feature. We welcome the new candidate into the field of photographic journalism.

"REVIEW OF REVIEWS."—The American *Review of Reviews* completed its second year with the March number, and with the April number opens the third year. The American edition is truly an international magazine, and well deserves the success with which the enterprise has been crowned.

THE Eastman Kodak Co. have issued a neat brochure, entitled "The Home of the Kodak." It is neatly gotten up on fine paper and fully illustrated, the subjects being the various buildings of the firm occupied by the company in Rochester, N. Y.

THE EASTMAN PRIZES.

EASTMAN KODAK COMPANY:

Gentlemen:—We, the undersigned judges, duly appointed by you to award prizes on pictures on Solio paper submitted for competition under your grand prize offer of recent date, after having carefully examined all the pictures, beg leave to submit the following report of our awards:

CLASS A.

1st prize, entry No. 7, G. M. Elton, Palmyra.
2d prize, entry No. 5, H. McMichael, Buffalo.
3d prize, entry No. 30, Stein & Rosch, Chicago.
4th prize, entry No. 26, B. L. H. Dabbs, Pittsburgh.
5th prize, entry No. 16, H. Randall, Ann Arbor.
6th prize, entry No. 11, Marceau & Power, Indianapolis.

CLASS B.

1st prize, entry No. 208, H. S. Squyer, Auburn.
2d prize, entry No. 222, B. L. H. Dabbs, Pittsburgh.
3d prize, entry No. 233, Bill & Overton, Cleveland.
4th prize, entry No. 224, Harman & Verner, Bay City.

In making the above award we have been guided by the conditions mentioned in your published circular, copy of which is hereto annexed.

Respectfully,

(Signed) J. F. RYDER, Cleveland, O.
W. F. VAN LOO, Toledo, O.
C. T. STUART, Hartford, Conn.

There were thirty-two (32) entries in Class A and fifty-nine (59) in Class B. The prints altogether cover about 600 or 700 square feet of wall space, and make a very creditable exhibit. A number of the most drominent photographers in the country were represented.